

Orthopedic Terminologies

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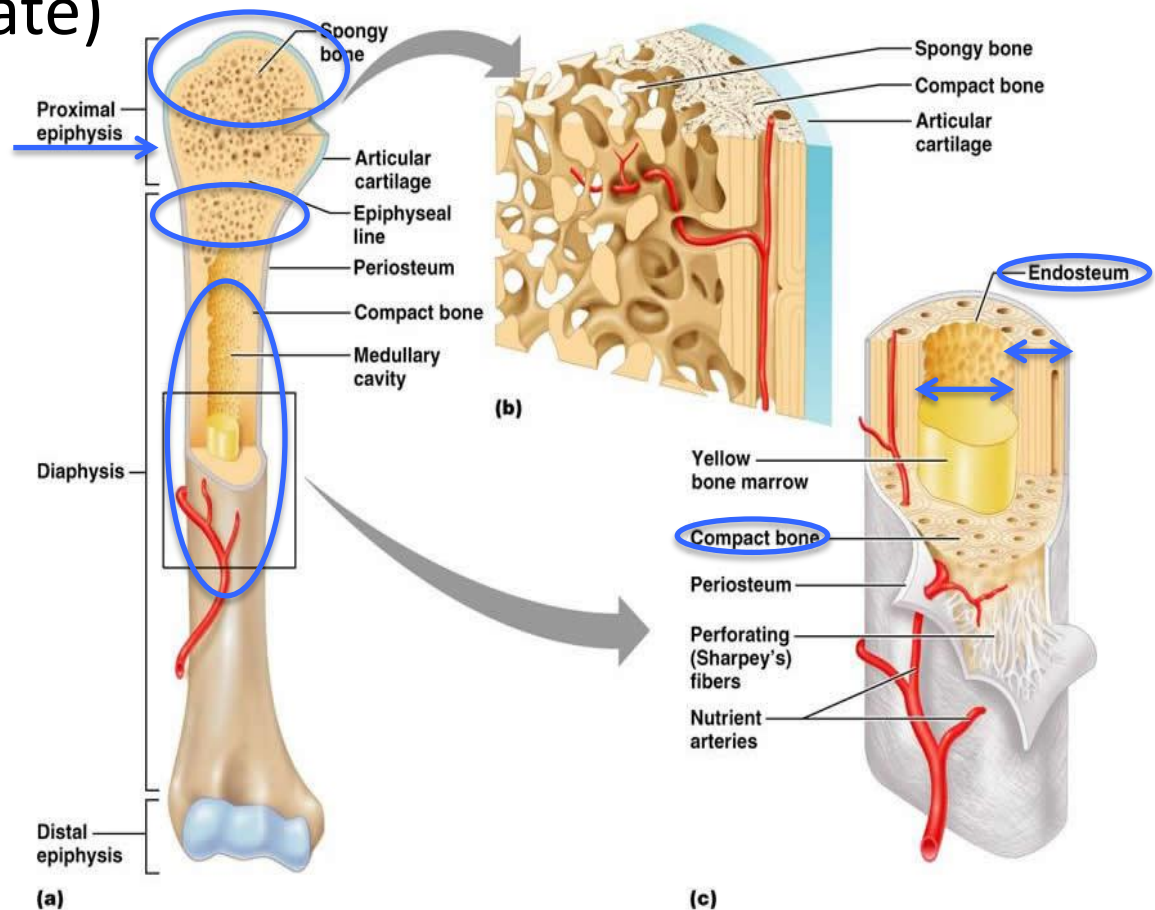
Topics to be Covered

- Bone Structure → Anatomy & Histology
- Bone Types
- Terminology →
 - Descriptive
 - Structural
 - Radiological

Bone Structures

Bone Anatomy

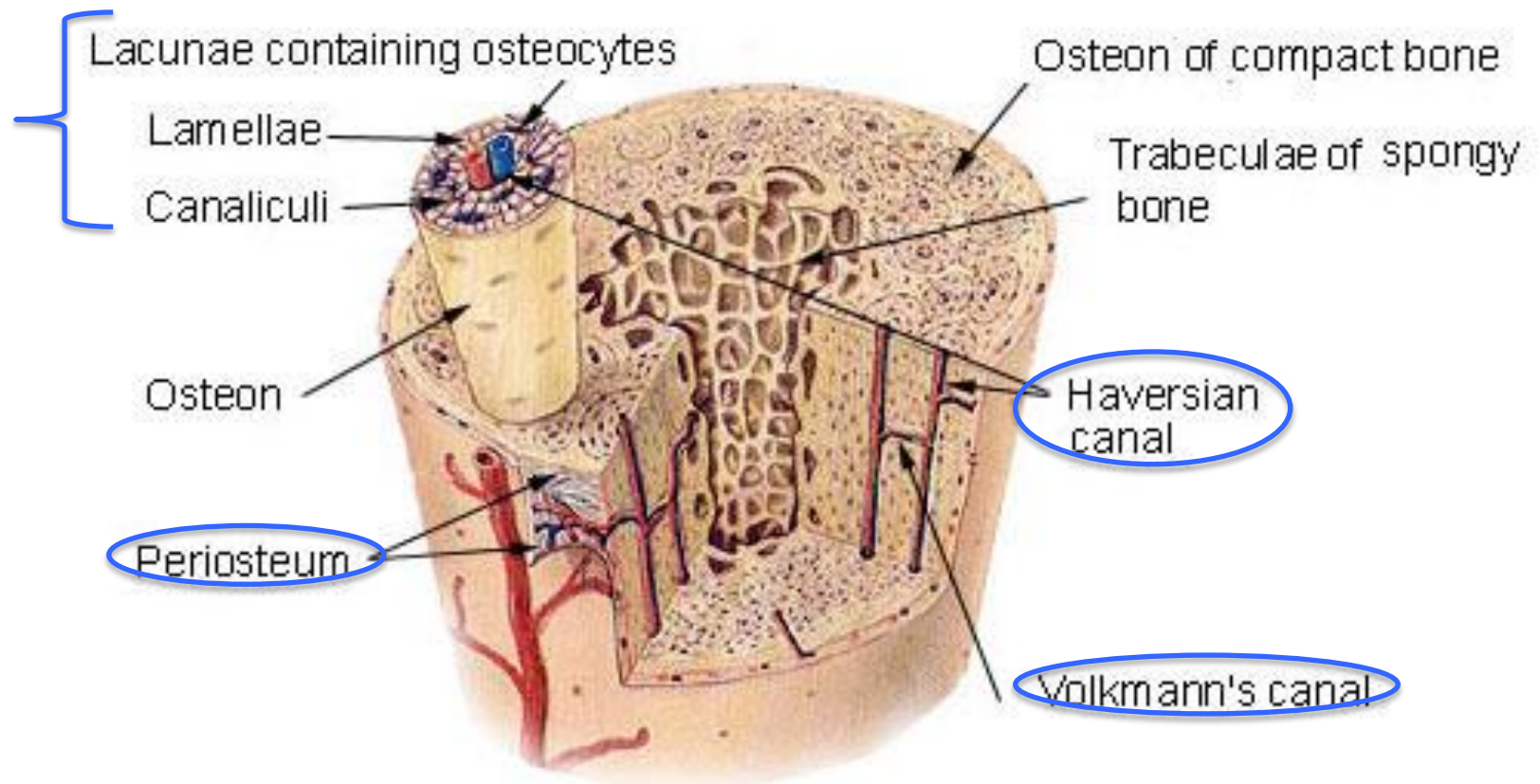
- Epiphysis
- Physis (growth plate)
- Metaphysis
- Diaphysis
- Periosteum
- Endosteum
- Cortex
- Bone marrow



Bone Anatomy

Haversian canal

Compact Bone & Spongy (Cancellous Bone)



Bone Histology

A) Cells:-

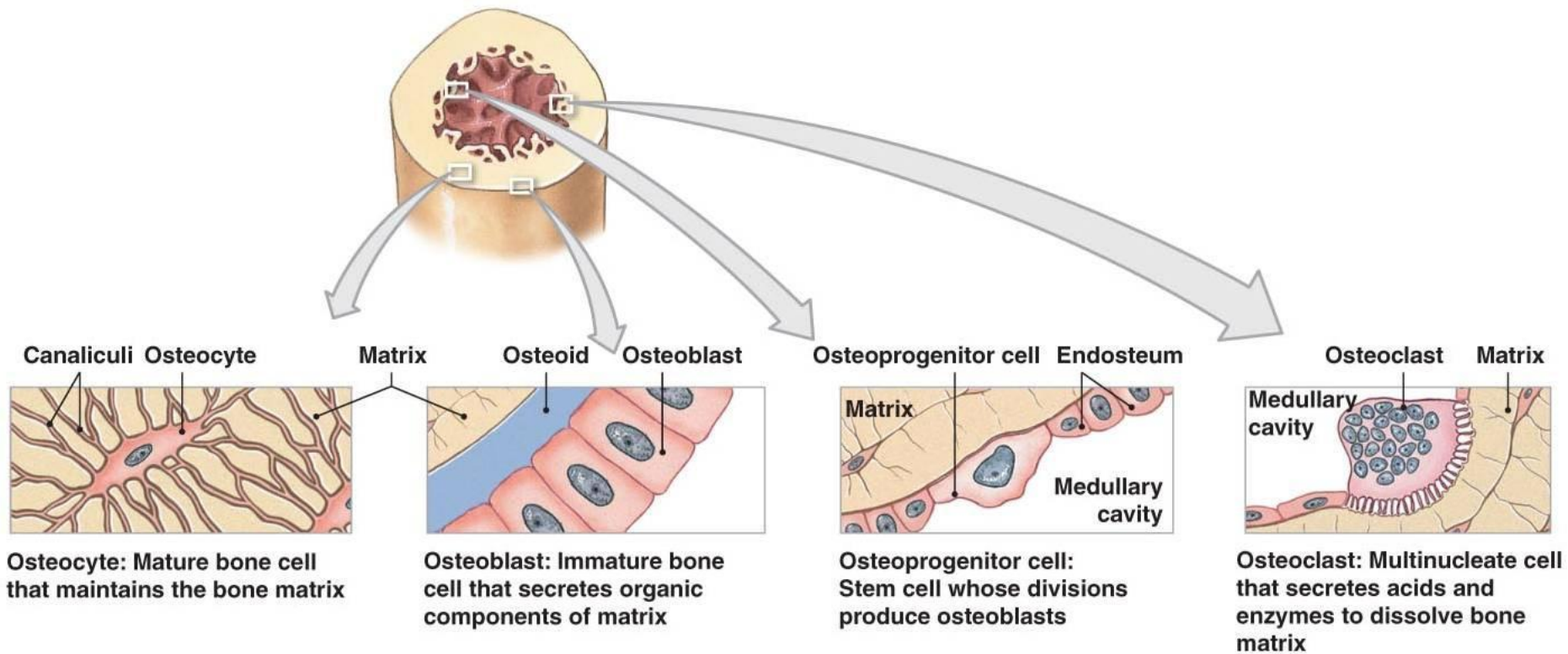
– Osteo →

- Blast (premature)
- Cyte (forming)
- Clast (scavenger)

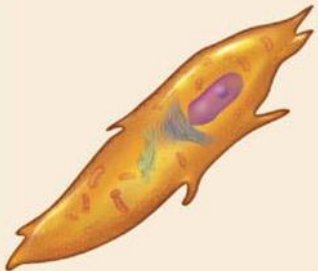

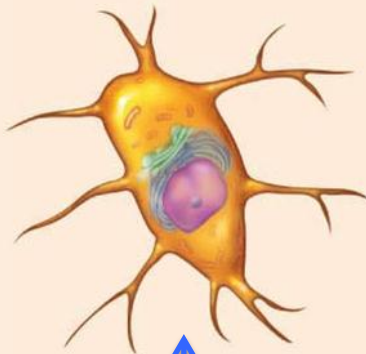
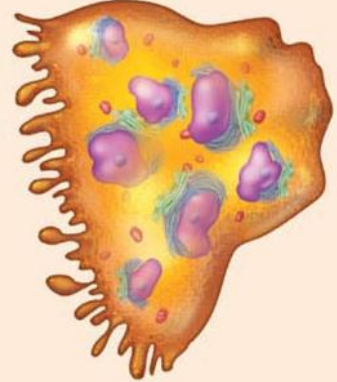
– Chondro → Cyte & Blast

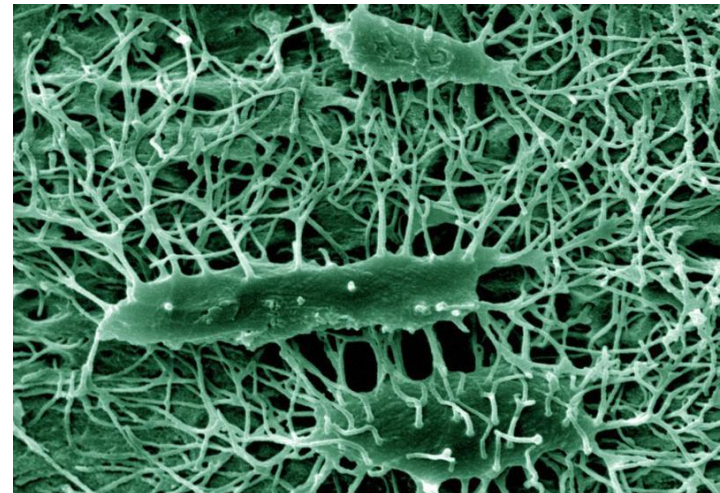
– Fibro → Cyte & Blast

Bone Histology

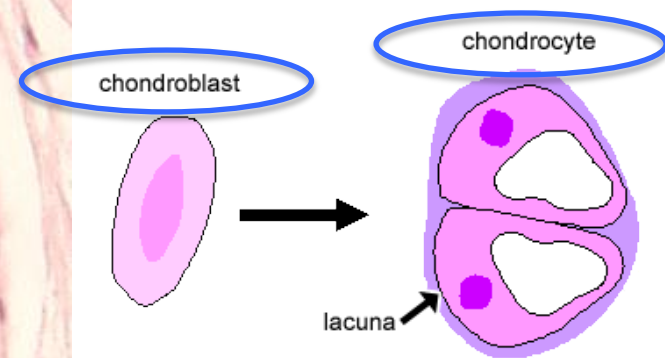
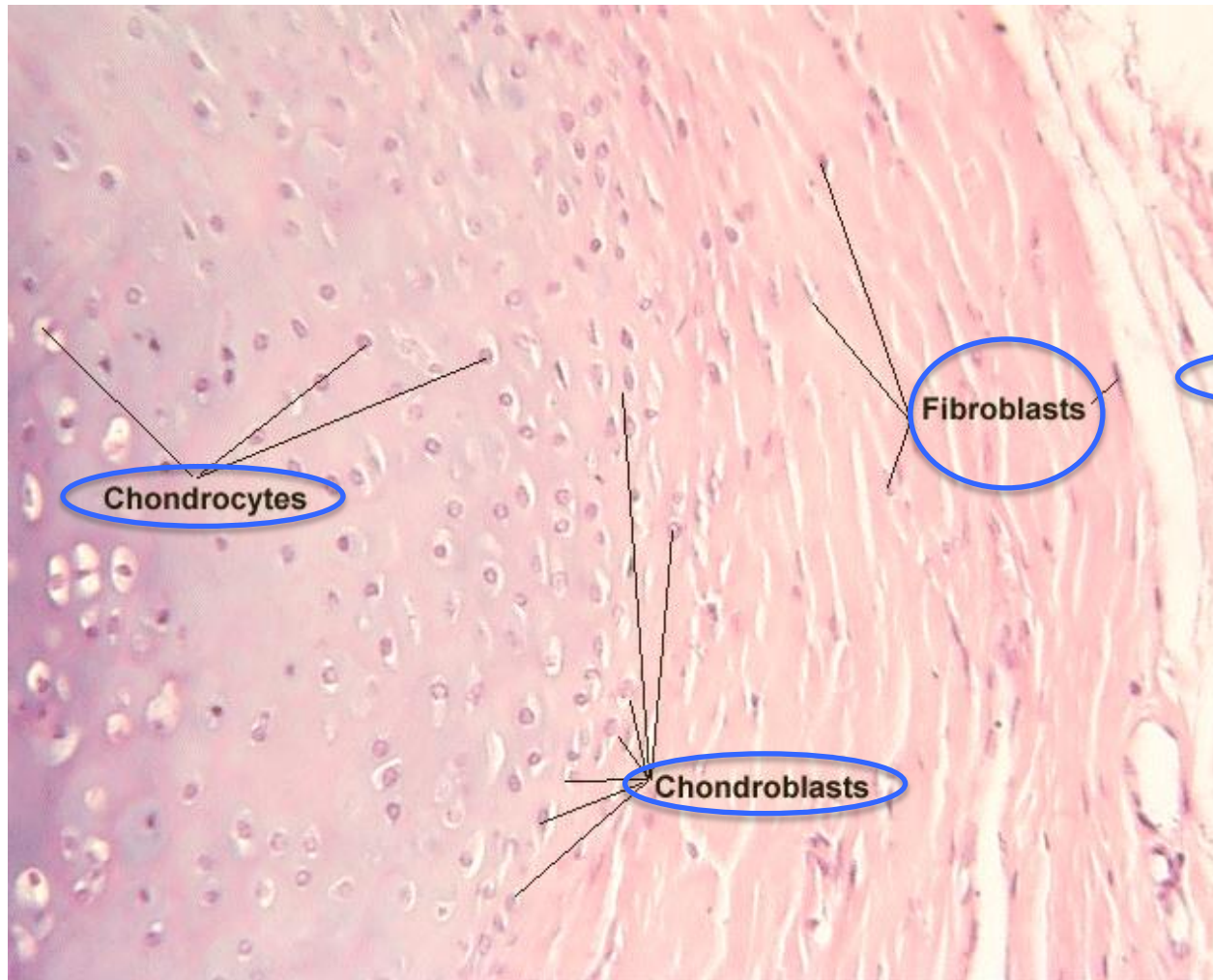


Bone Histology

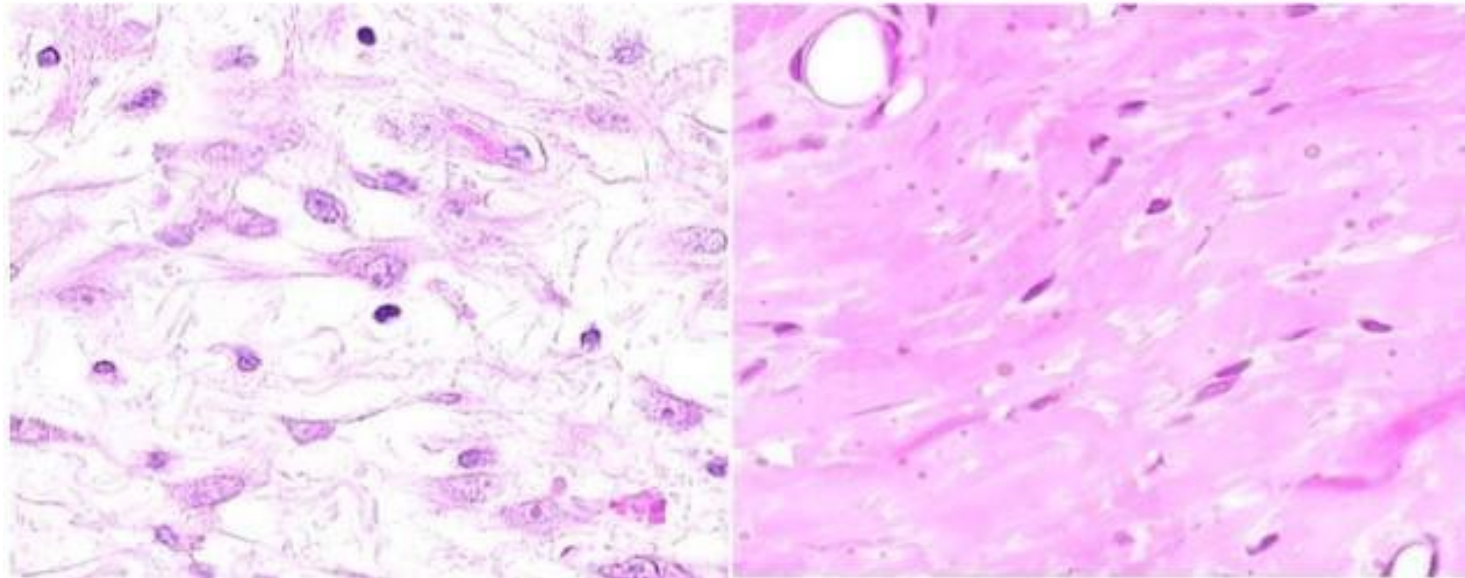
(a) Osteogenic cell	(b) Osteoblast	(c) Osteocyte	(d) Osteoclast
<p>Stem cell</p> 	<p>Matrix-synthesizing cell responsible for bone growth</p>  ↕	<p>Mature bone cell that maintains the bone matrix</p>  ↕	<p>Bone-resorbing cell</p> 



Bone Histology



Bone Histology



Bone Histology

B) Matrix:-

– Organic →

- 40% of the dry weight
- Collagen II

– Minerals →

- 60%
- Calcium hydroxyapatite & Calcium phosphate

Bone Types

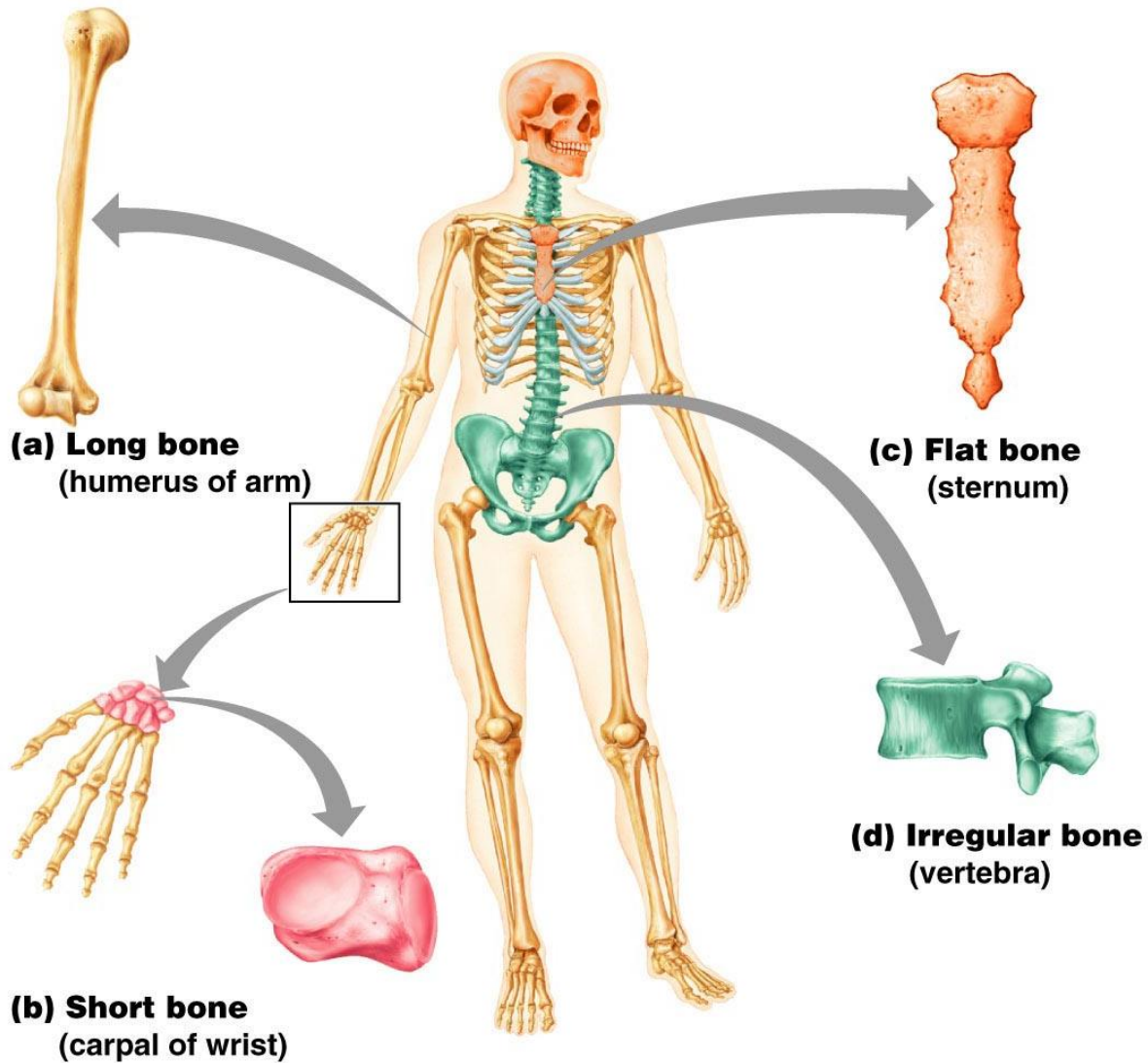
Bone Types

MORPHOLOGICAL CLASSIFICATION

1. Long bones
2. Short bones
3. Flat bones
4. Irregular bones
5. Pneumatic bones
6. Sesamoid bones
7. Accessory bones



Bone Types

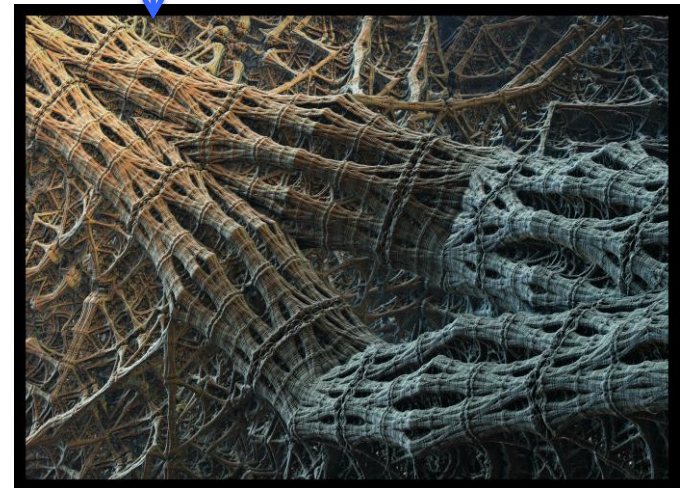
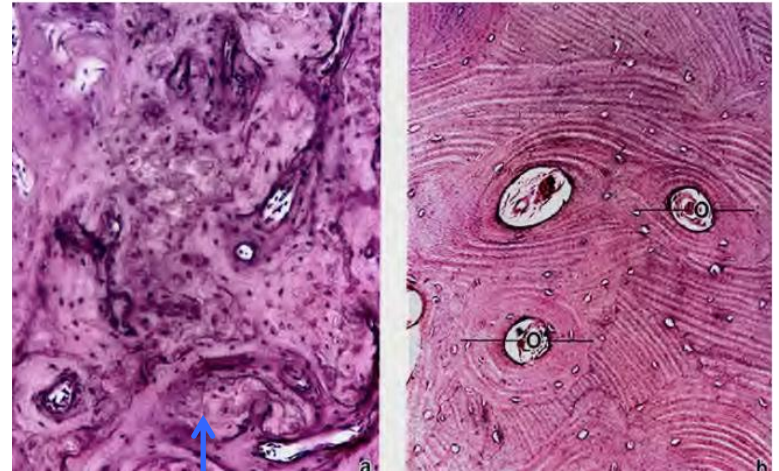


Bone Types

- **Lamellar** →
 - Cortical 80%
 - Cancellous 20%
- **Woven** →
 - Immature
 - Pathological

Immature and Mature Bone

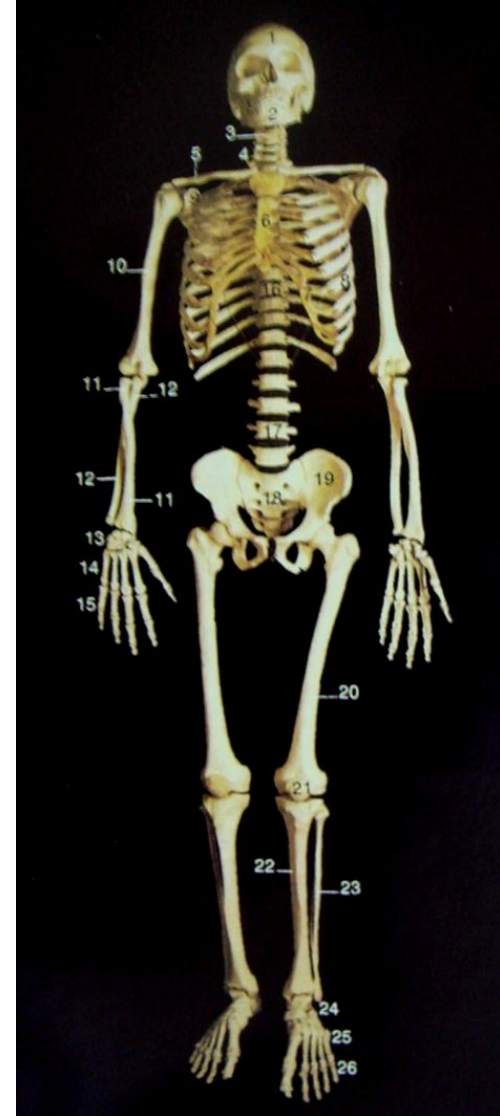
(nonlamellar, bundle, or woven bone)



Descriptive Terminology

Terminology

- Elbow → Cubitus
- Thumb → Policis
- Index → Indices
- Hip → Coxa
- Knee → Genu
- Foot → Pes / Pedis
- Big toe → Hallux



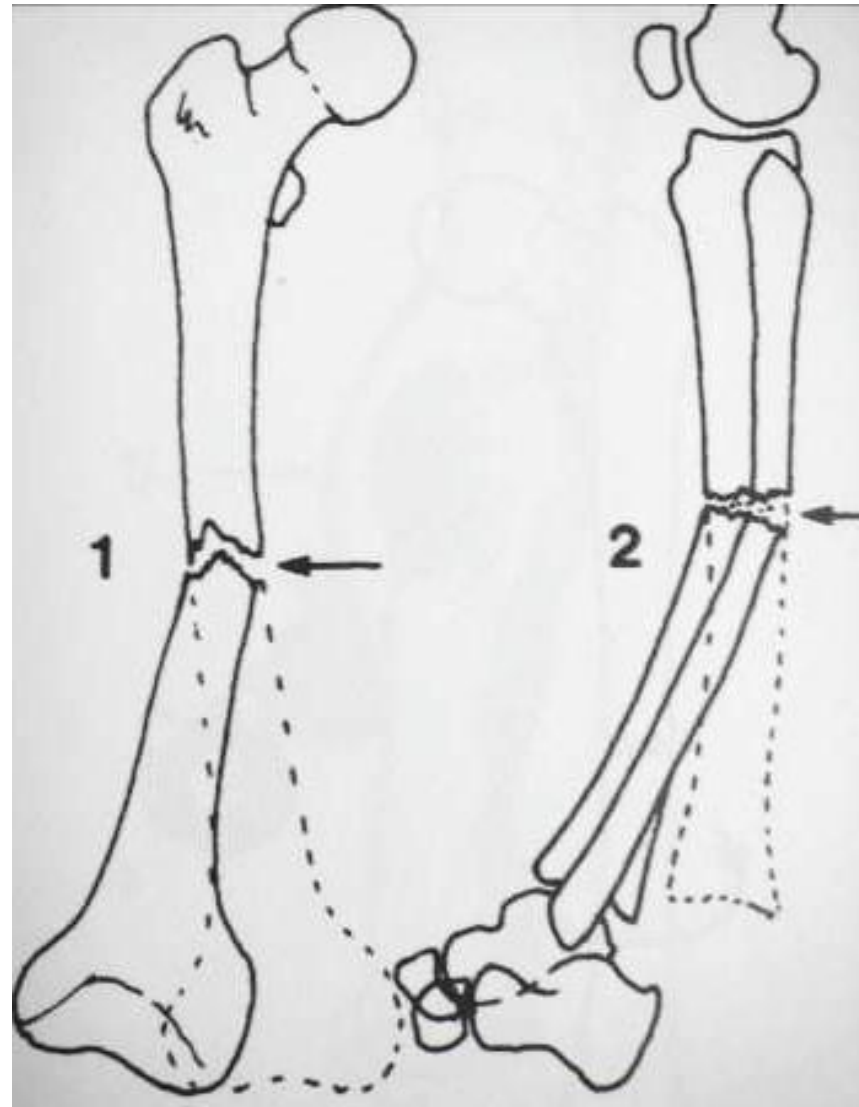
Terminology

When describing

→ a Deformity or

→ a Displaced #

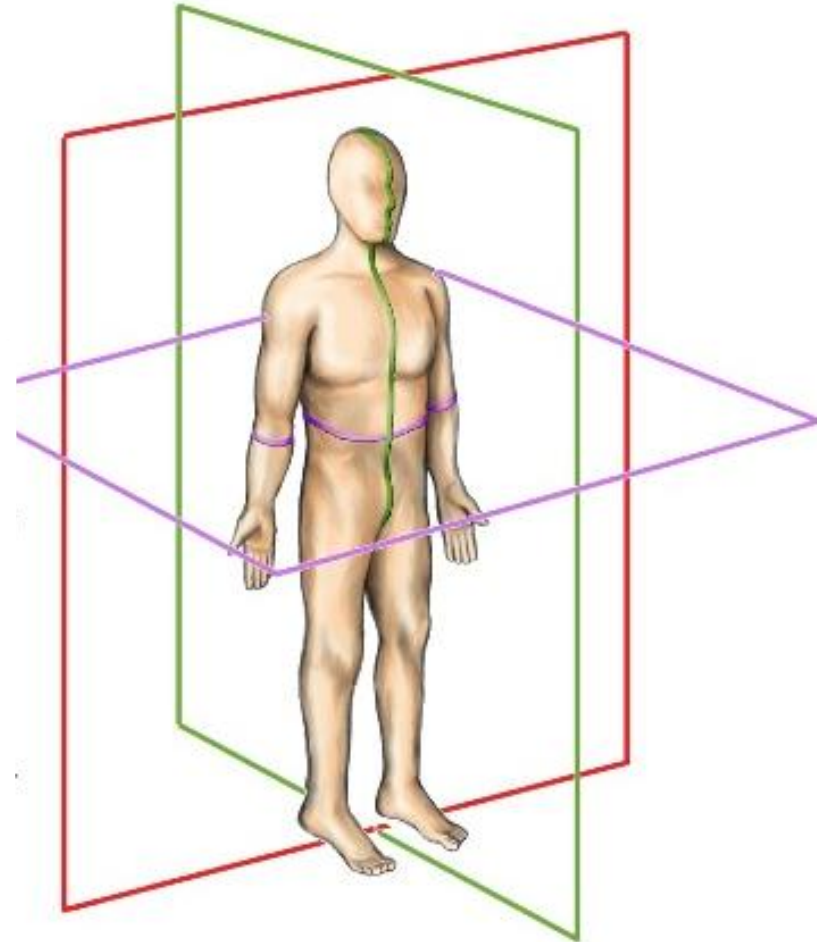
Always comment on
the ***Distal*** fragment



Terminology

Anatomical Planes

- **Coronal**
- **Sagittal**
- **Axial**



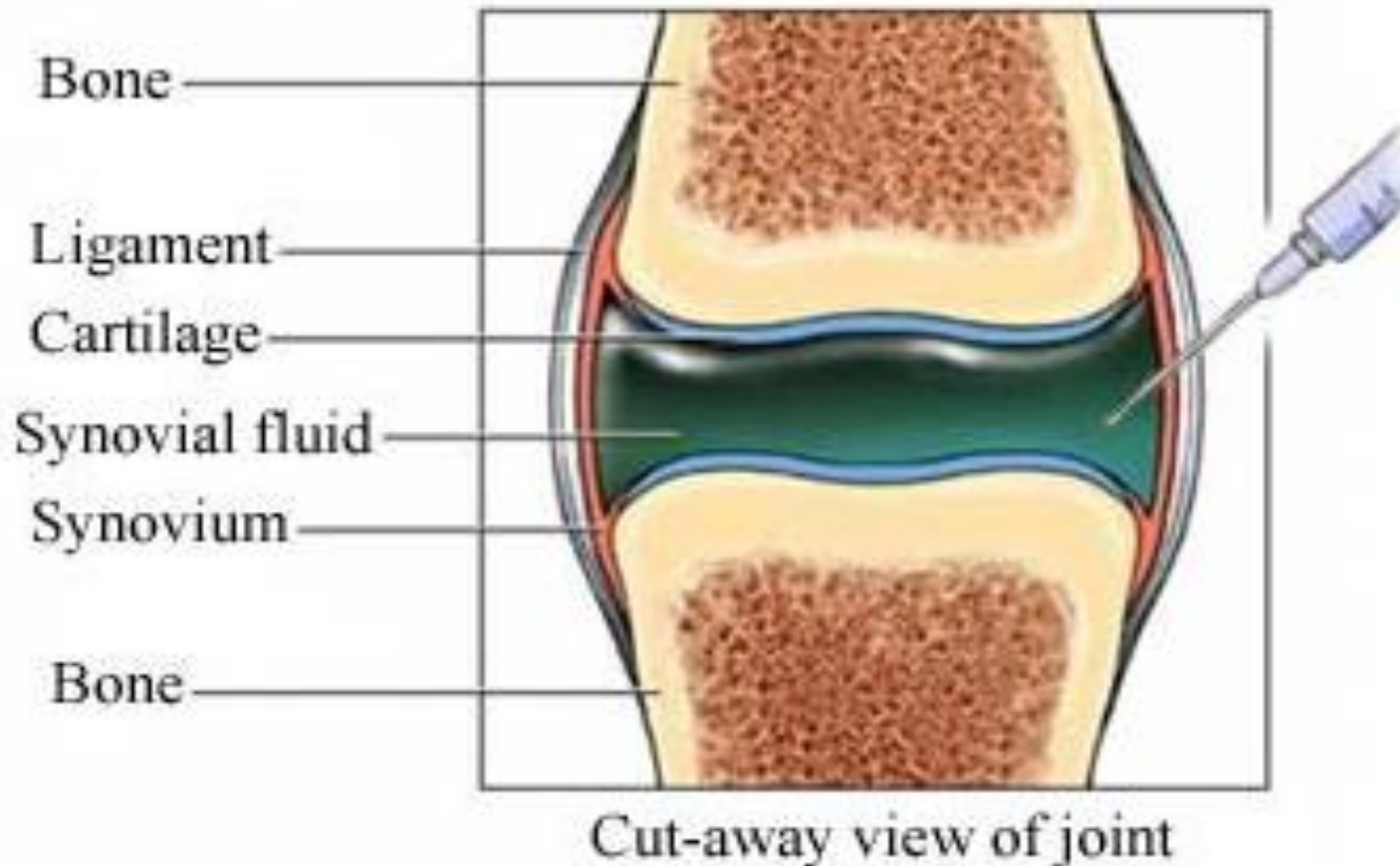
Terminology

Arthroscopy (Endoscopic examination of a joint)



Terminology

Arthrocentesis (Joint Aspiration)



Hand Terminology

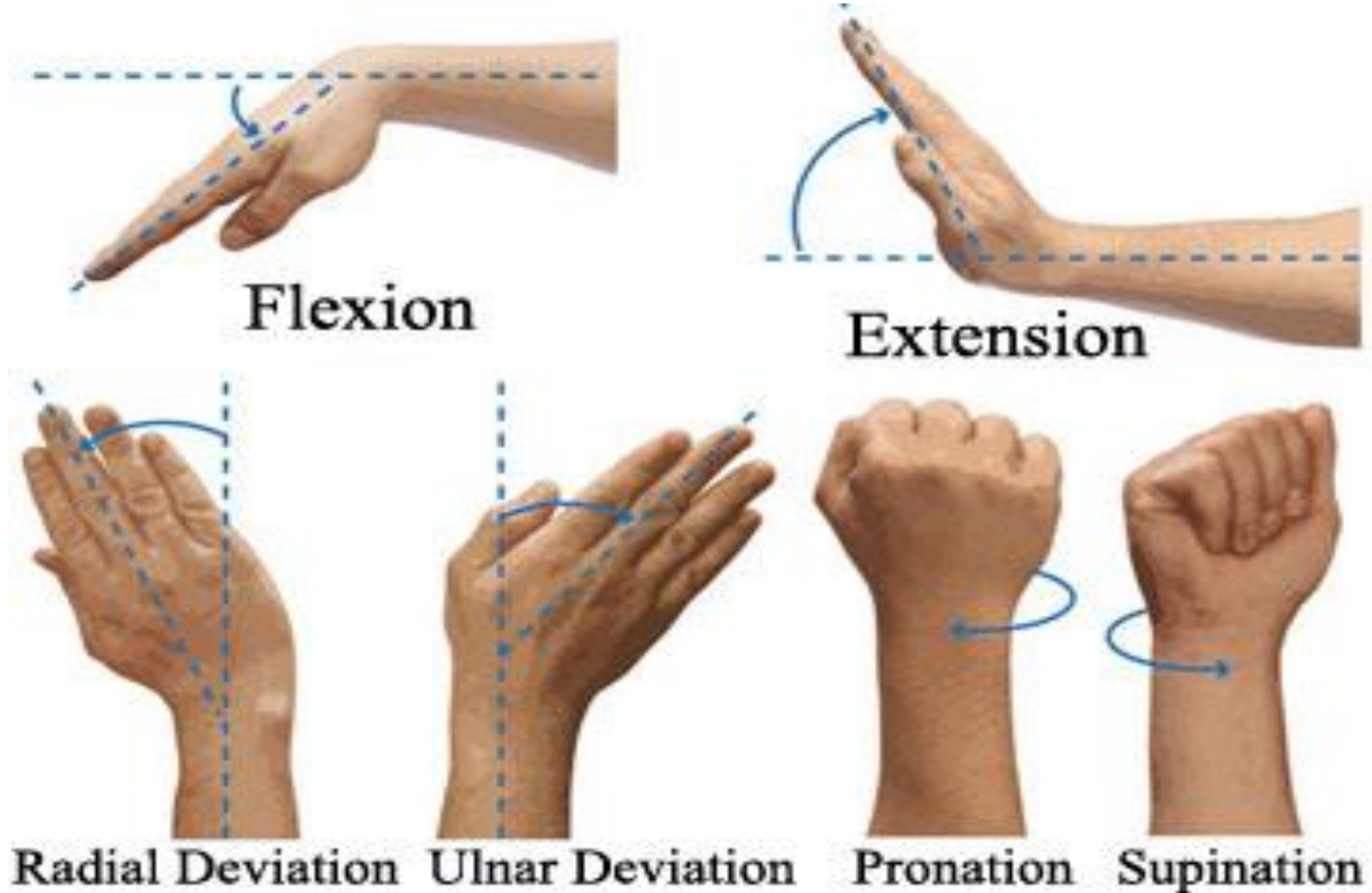
Name

- Palm = Volar aspect
- Dorsal
- Ulnar side
- Radial side

Motion

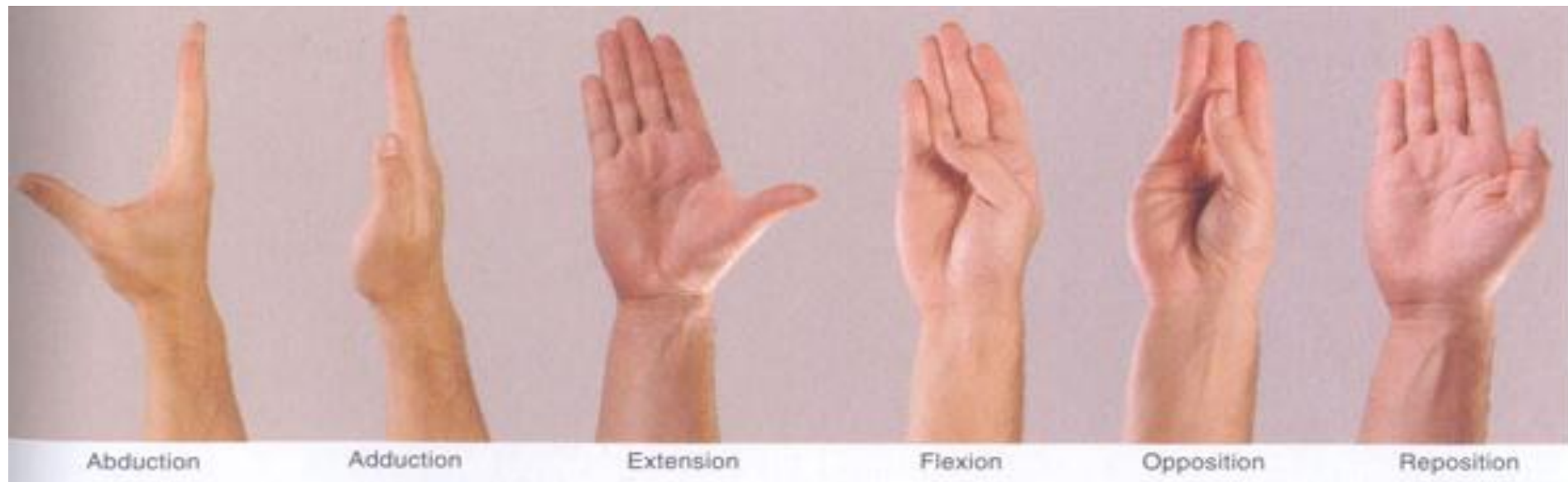
- Flexion = Volar Flexion
- Extension
- Ulnar deviation
- Radial deviation
- Pronation / Supination

Hand movements



Thumb Terminology

- Flexion / Extension
- Adduction / Abduction
- Opposition



Foot Terminology

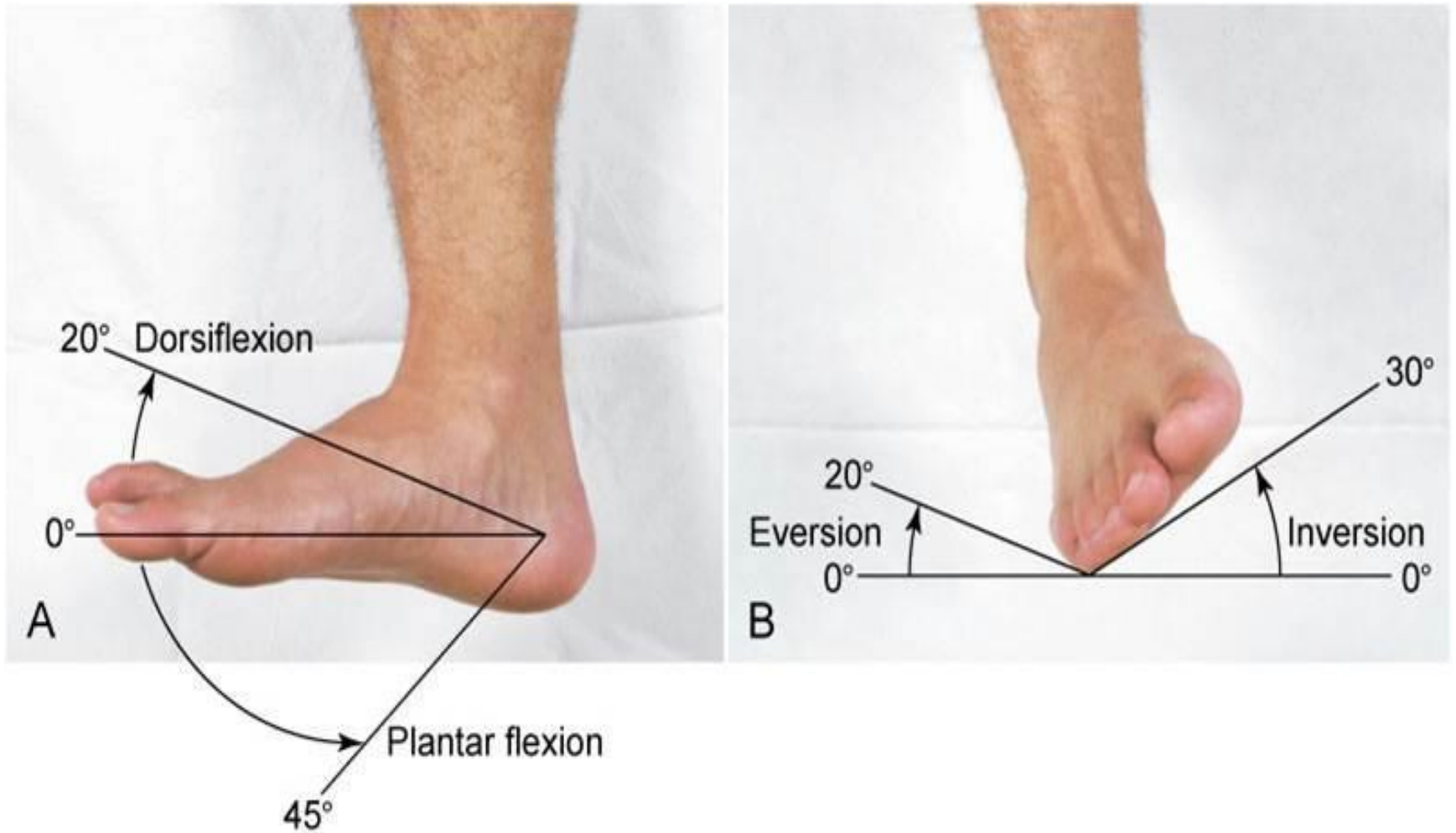
Name

- Sole = plantar aspect
- Dorsal
- Subtalar joint
- Mid foot
- Hind + mid foot

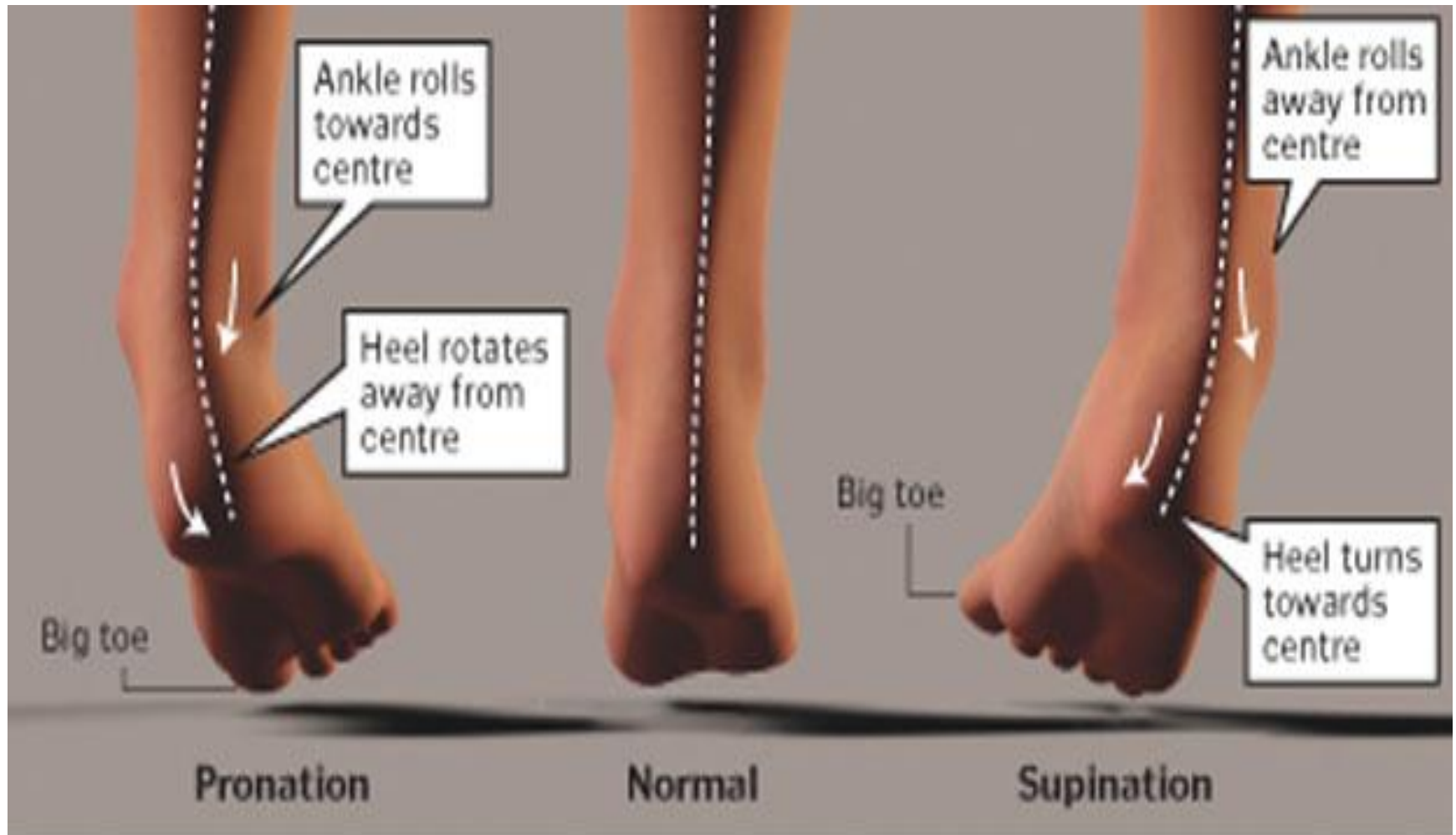
Motion

- Plantar flexion
- Dorsi-flexion (extension)
- Varus / valgus
- Supination / pronation
- Inversion / eversion

Foot movements



Foot movements



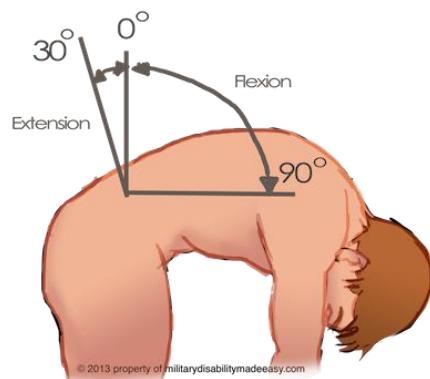
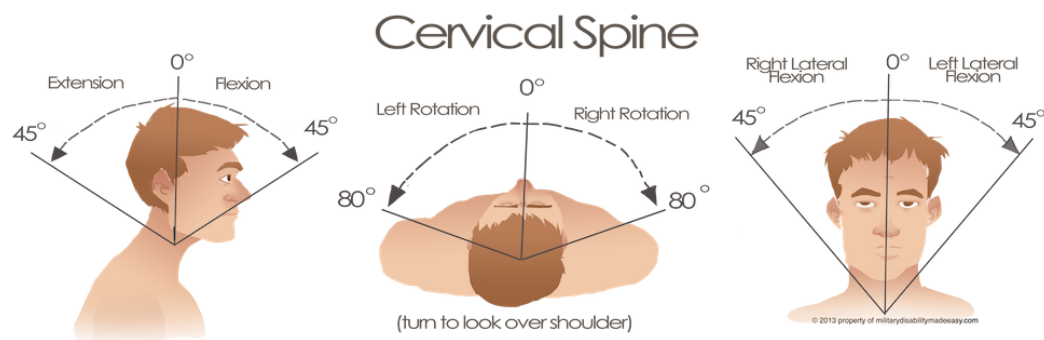
Foot Terminology

- Mid foot:
 - metatarsus adductus
 - Pes planus = flat foot
 - Pes cavus
- Hind foot:
 - Calcaneo valgus
 - Calcaneo varus

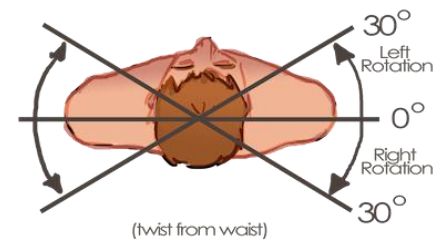
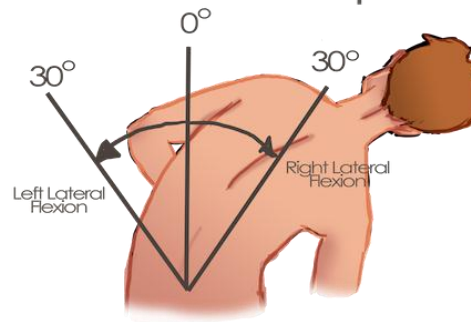


Spine Terminology

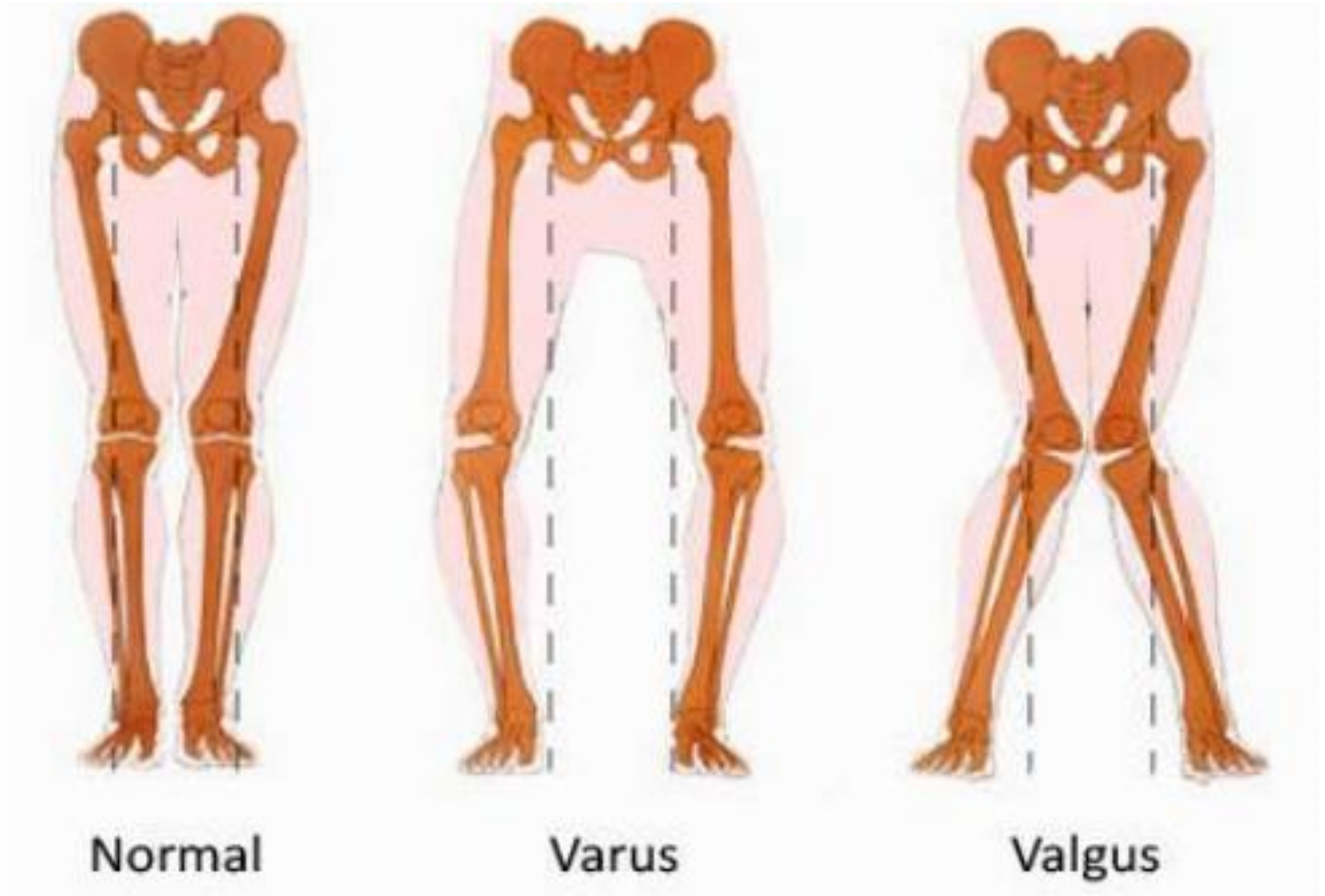
- Flexion
- Extension
- Bending → Rt /Lt
- Rotations → Rt /Lt



Thoracolumbar Spine



Alignment Terminology



Alignment Terminology

Recurvatum (hyperextension)

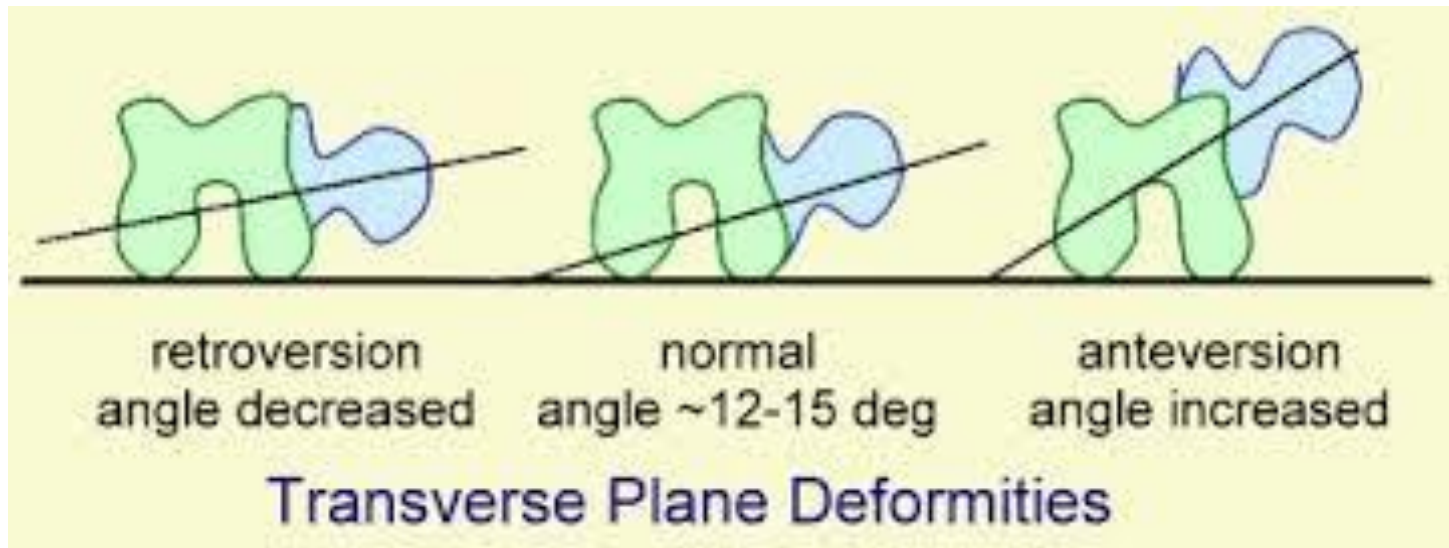
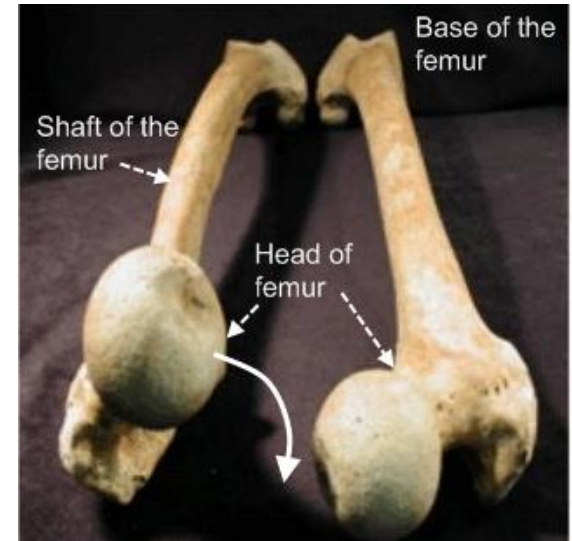


Procurvatum



Rotation Terminology

- Version → increased normal angle
- Types:
 - Anteversion → anterior
 - Retroversion → posterior



Rotation Terminology

- Torsion → abnormal rotation
- Types:
 - Internal
 - external

Rotational Deformities

Normal



Internal tibial torsion



External tibial torsion



Structural Terminology

Bone

Fracture (#) is a **Break** in the structural continuity of bone

- **Open #** → # with a **wound** communicating with it
- **Closed #** → # with **intact skin**
- **Pathological #** → it's a # in a **diseased bone**
- **Crush injury** → it's high energy force from heavy object, with severe soft tissue & bone injuries

Crush Injury (U.L)



Crush Injury (L.L)



Bone

- **Complicated #** → # with injury to a major Blood vessel, nerve or nearby structures
- **Comminuted #** → Multi-fragmented #
- **Complex #** → avoid to use

Joints

- Dislocation → Complete loss of contact of articular surfaces
- Subluxation → Partial loss of contact of articular surfaces
- # Dislocation → Joint dislocation with a #
- Avulsion # → # of a bone tip at a tendon insertion

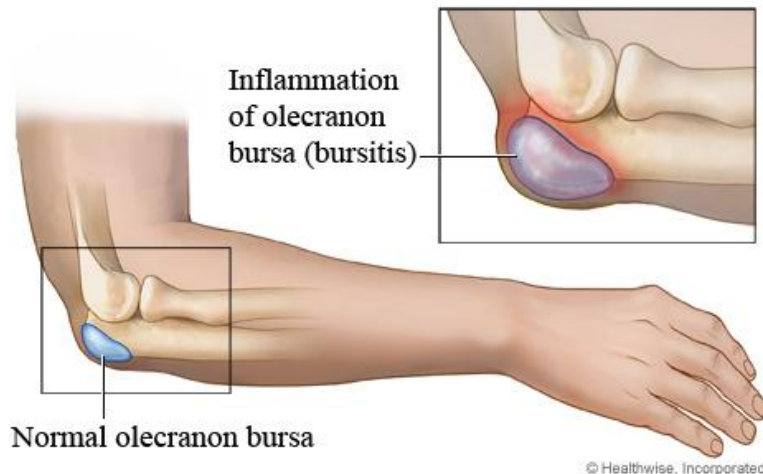


Patellar avulsion fractures



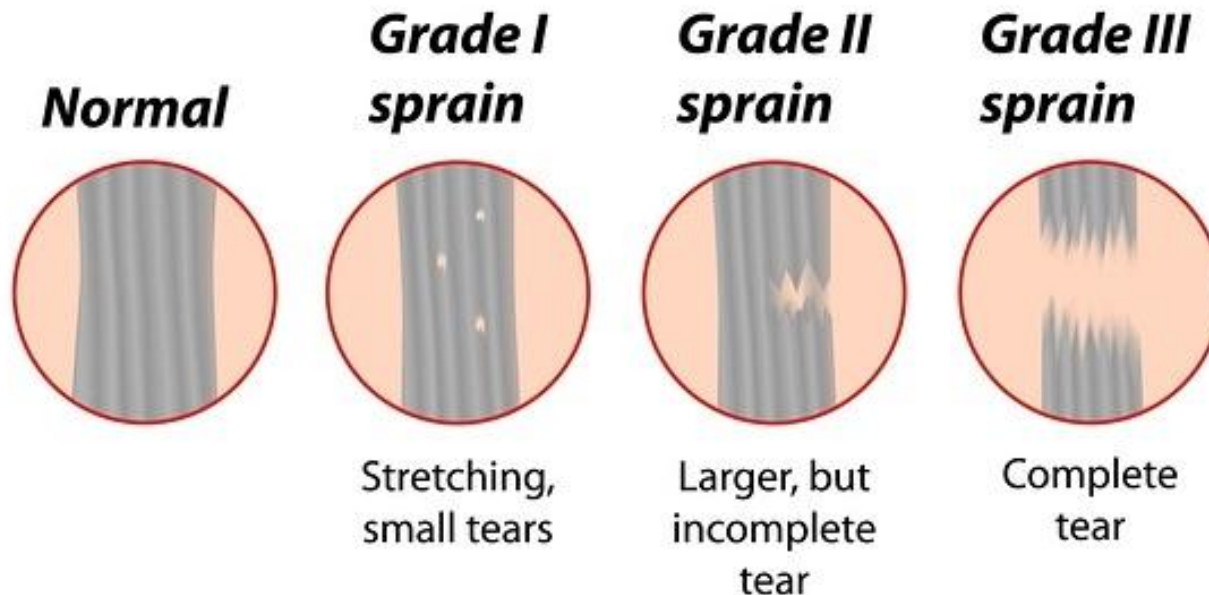
Joints

- **Stiffness** → Restricted motion in **one or more directions**
- **Fixed Deformity** → Loss of all Range of Motion
- **Bursitis** → Inflammation/infection of a bursa at bony prominence



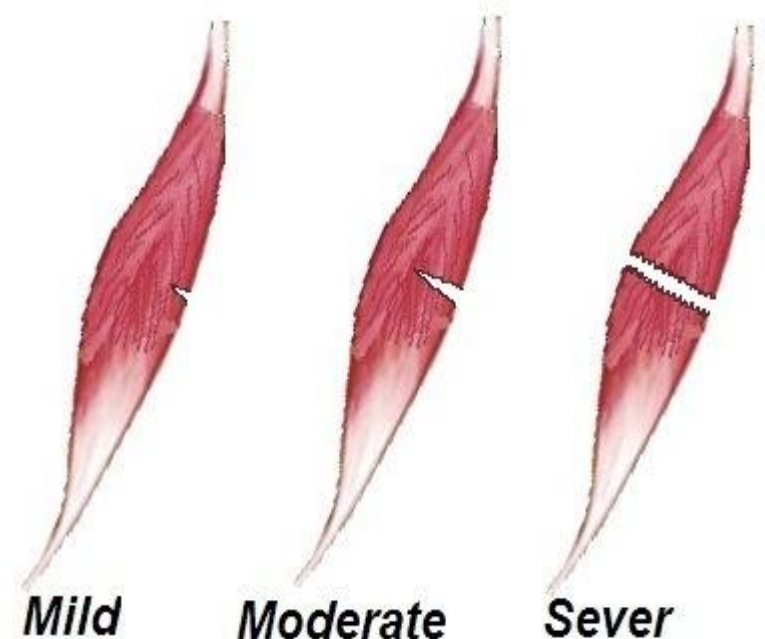
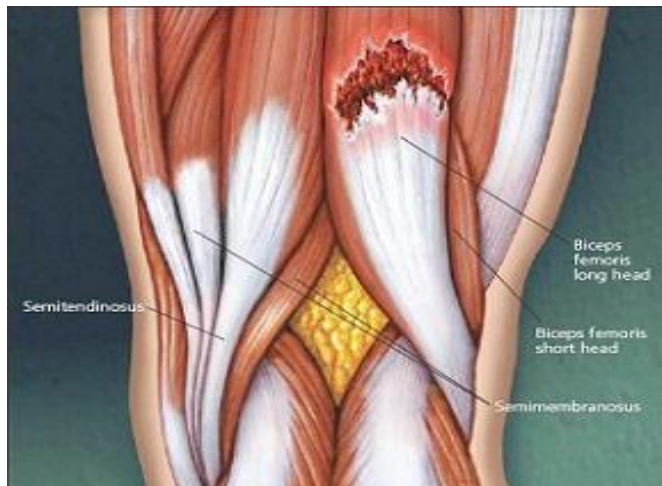
Ligaments / Tendons

- **Sprain** → Tear of some fibers only
- **Partial tear** → Incomplete tear
- **Complete tear**



Muscle

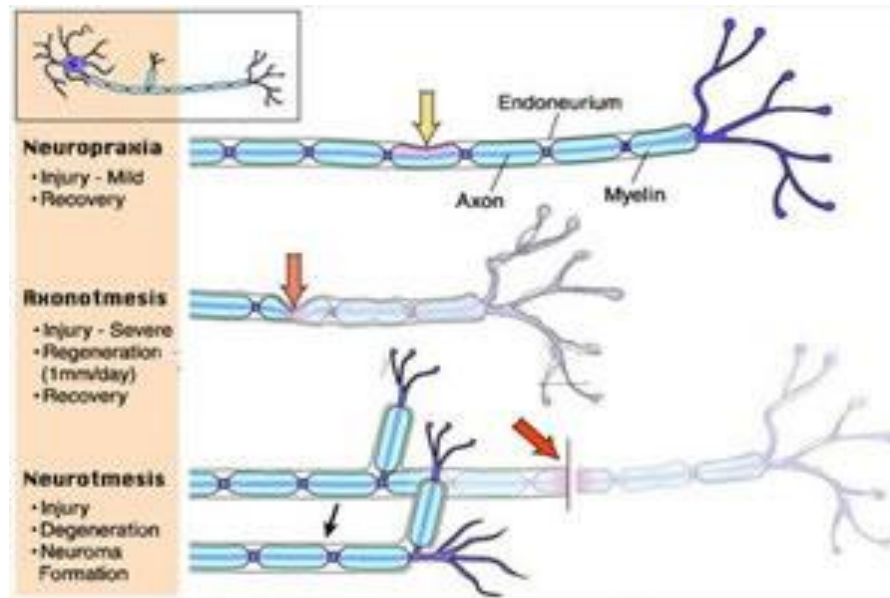
- **Contusion** → Small hematoma within muscle fibers
- **Strain** → Tear of some fibers only
- **Tear** (partial/complete) at →
 - Belly
 - Musculo-tendinous junction



Nerves

- **Neurapraxia** → Reversible nerve **conduction block** due to segmental demyelination
- **Axonotmesis** → Cut of the nerve axon with an intact myelin sheath
- **Neurotmesis** → Complete nerve cut

Nerves

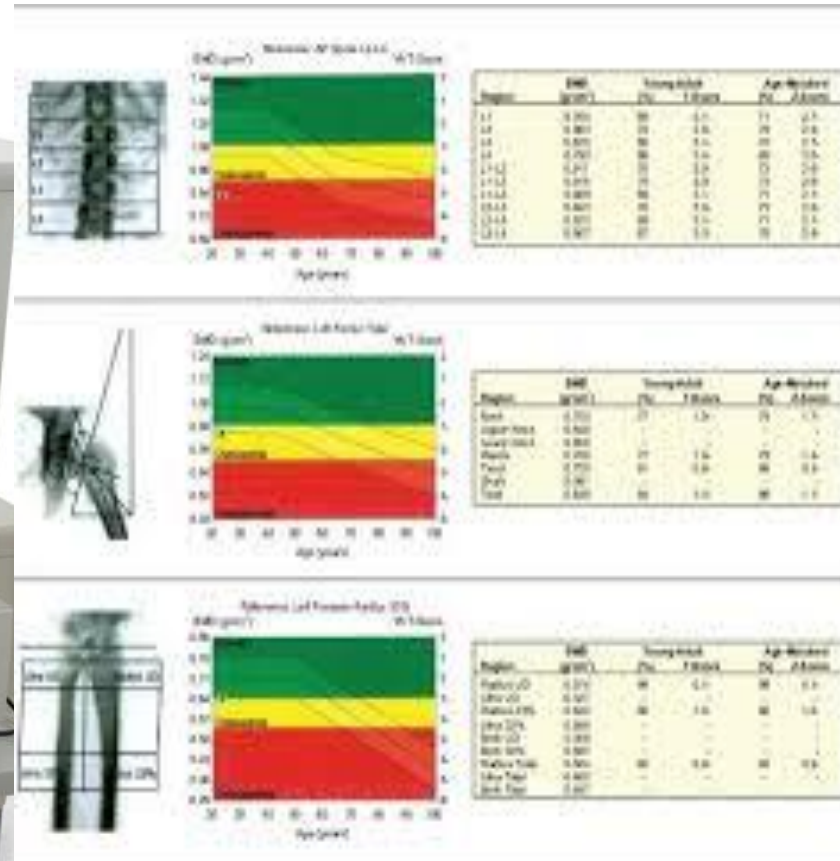


Radiological Terminologies

Radiological Terminologies

- X-ray (Plain & Contrast)
- CT
- MRI
- Bone scans (Isotopes)
- DEXA → Dual Emission XR Absorptiometry
- Arthrogram → Contrast in a joint

DEXA Scan



Arthrogram



Any Questions ?

Remember

- Bone Structure → Anatomy & Histology
- Bone Types → Long; Short; Flat; Irregular; Lamellar; Woven
- Descriptive → Latin terminology; Alignment; Rotation
- Structural disorders → Bone; Joints; Ligaments; Muscles; Nerves
- Radiological → DEXA; Arthrogram; MRI; CT; Isotope scan